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falling temperature of the air, but a drifting wreck gives no such timely warning of its dangerous neighborhood. This danger is especially great in the night, in foggy or thick weather, and when the derelict is bottom-up or deeply submerged. An instance of narrow escape was the experience of the steamship 'Louisiana,' Sept. 19. While steaming at fourteen knots an hour in the Gulf of Mexico, she passed within fifty feet of a vessel two hundred feet long, bottom-up.

It is hoped that the conference will devise some plan to rid the ocean of these obstructions, or, at least, of the most dangerous of them.

The "King Devil."

In August, 1879, Prof. Lester F. Ward, while returning from a hunting-excursion in the North Woods, discovered near Carthage, N.Y., a new variety of *Hieracium* (house-leek), of which he obtained two specimens. The next day, after a long search, he found on a farm at Evans Mills—a small village about ten miles from Watertown—large colonies of the same plant. The individuals were many of them smaller and slenderer than, but there was no doubt that they were of the same species as, the specimens secured the day before. He secured a great number of the specimens, and remarked to his companion, that, unless the farmers of that region adopted some measures to destroy that weed, it would give them much trouble in the future.

On his return to Washington, Professor Ward identified his specimens as belonging to the species *Hieracium præaltum*, a variety of house-leek very common, and a great pest to farmers in many parts of Europe, but little known in America.

Last summer Professor Ward visited St. Lawrence County again, and one of the first things he was informed of was the appearance, six or eight years ago, and the rapid spread since, of a weed they called the "king devil." Professor Ward at once identified it as the novel variety of house-leek he had discovered during his former visit in that neighborhood, and, of course, recalled to mind the warning he then uttered. When the king devil once gets into a field, it completely covers the ground with its continuous green leaves, preventing the growth of any other plant or weed. It took such complete possession of one field of thirty acres, that there was absolutely nothing else on it—there could be nothing else.

Inquiry as to the local origin of the king devil traced it to the farm where Professor Ward had found the colony in 1879; and here, therefore, was the nest in which was hatched one of the worst pests the farmers of the United States have ever had to encounter, and from which it has spread over the country. In the region where it first appeared it has already extended over a belt of country fifteen miles wide, the length of which Professor Ward did not ascertain. It has been reported thirty miles west of Kingston, Canada, and in other places.

Various methods of eradicating the king devil have been suggested, but none of them have proved effective except the thorough salting of the land. This, of course, is expensive, and destroys all other vegetation as well as the noxious weed against which it is directed; but the field can be restored, and, while the king devil has possession of it, it is of no use whatever to its owner.

An Apparatus for studying Insects under Ground.

Prof. H. J. Comstock of Ithaca has, by a very simple invention, greatly extended the field of investigation for entomologists. He has made it possible for them to see insects under ground, and study their subterranean habits. The apparatus consists of a narrow frame made of wood, the two broad sides enclosed with glass. A sheet-iron shutter or screen is fitted to slide before the glass on each side, and, at ordinary times, exclude the light. Two sides and the bottom of the box thus formed are therefore narrow, and composed of wood, while the other two sides are broad pieces of glass. The top is open.

This box is filled with earth, and any plant that may be selected is set out in it. The insect living under ground that is an enemy of this plant, and whose habits it is desired to study, is also placed in the earth. The sides of the box are then closed with the screens, so as to secure the same conditions in the soil in the box as under ground in nature. From time to time, as it is desired to investigate, the screen on one side is temporarily removed, and through

the glass the movements of the insects may be observed, changes in their development noted, and important discoveries may be made.

The apparatus is made of all sizes and various shapes, so as to adapt it to any special investigation that may be undertaken. Professor Comstock has one at Ithaca so large that he keeps it in a hole in the ground, and raises and lowers it by means of a rope attached to a pole. It is admirably adapted to the study of the roots of growing plants, and may be so modified as to expose to view the underground habits of small animals that burrow.

COMMERCIAL GEOGRAPHY.

Bokhara and the Transcaspian Railroad.

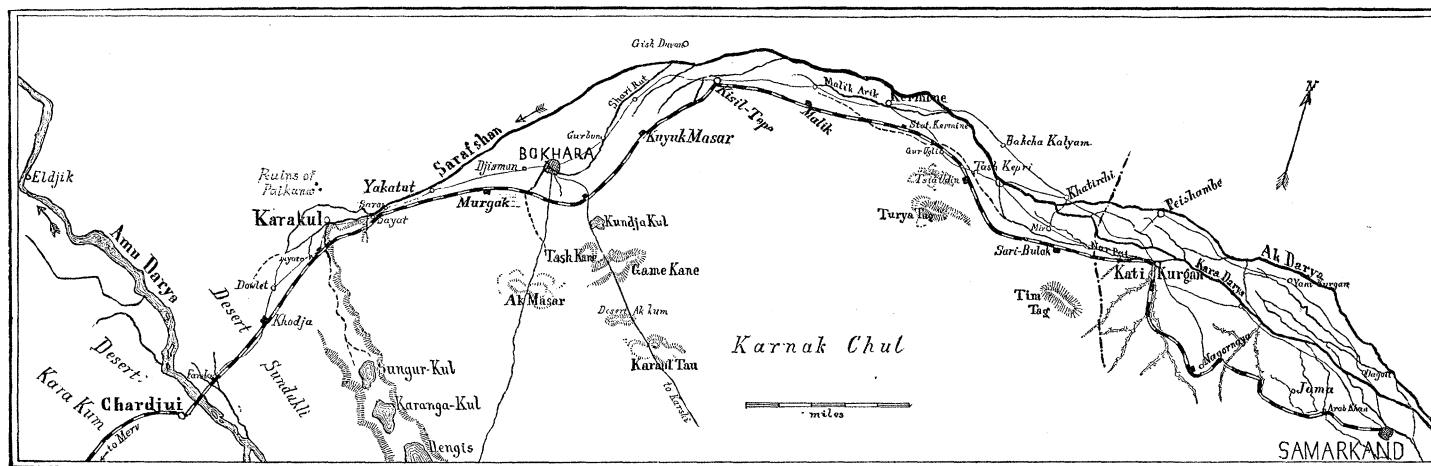
THE rapid changes brought about by the construction of the Transcaspian Railroad in Bokhara and Samarkand form the subject of an interesting paper by Dr. O. Heyfelder, which was published in the October number of *Unsere Zeit*. On Jan. 18, 1888, the great bridge across the Amu Darya at Chardjui was completed, and on May 27, Samarkand was reached. The railroad runs in a northeasterly direction from Merv to Chardjui, and, a short distance south of the latter place, enters the territory of Bokhara. Near Karakul it reaches the Sarafshan, which it ascends. Samarkand became a Russian province in 1868, but until recently it was almost isolated, large deserts being situated north-west and south-west of it. A road connects the city with Tashkent, from which place it took twenty-one days to reach St. Petersburg. The telegraph from Samarkand to St. Petersburg followed the same road. Since the opening of the railroad the state of affairs in the whole valley of the Sarafshan has greatly changed. The people of Bokhara were at first opposed to the enterprise, as it brought the country still more under Russian and Christian influence. For these reasons they insisted upon the road passing the city of Bokhara at a distance of several miles; but it seems that after the road was once opened they quickly acquiesced in the new state of affairs, and the country is now open to European, or rather Russian, influence. Lady physicians, who practise in Samarkand and Tashkent, have had a great influence upon the population, and the medical staff of the railroad is doing good work in Bokhara. Heyfelder believes that their influence will be sufficient to improve the hygienic conditions of the filthy cities of that country. European manufactures are introduced by branch offices of Russian houses, and particularly through their establishments European influence is gaining greater strength. The first of these branch offices was founded in Bokhara in 1874, after the ratification of the treaty of commerce; but the greater number were established after the completion of the railroad to Merv, and after its continuation to Samarkand had been decided. At present they are not confined to the capital, but Russian merchants are found in every city of the country. The extent of its trade will be understood from the fact that merchants from Bokhara visit annually the great fair of Nischnii-Novgorod to sell the produce of the khanate. Silk manufactures from Samarkand are sold in St. Petersburg, Moscow, and Kharkow. Sheep are purchased in Karakul, and transported by rail to the Dnieper; lamb-hides are sold to Moscow, lumber to Asia Minor; and carpets from Bokhara are valued all over the Orient. While, according to the treaty, the importation of European manufactures is favored, a wise article prohibits the sale of alcohol in the khanate. Gambling and the use of liquors have been introduced by the Russians into Samarkand, not to the advantage of the natives. It is doubtful whether the influence of the Europeans will have a wholesome effect upon the trades of the people. At present they are skilful potters, turners, embroiderers, and leather-manufacturers. It is, however, a frequent experience that trades of this kind are unable to compete with the cheap products of European machines, and that the introduction of improved methods is accompanied by a decline in native art. Samarkand and Bokhara are dependent upon the Sarafshan, cultivation being possible only by means of irrigation. There exists an admirable and complicated network of canals all along the river; but, of course, no scientific methods of irrigating are used, and consequently a great portion of the available water is wasted. Russian influence will undoubtedly tend to improve the methods applied, and thus the extent of arable land and the value of its produce will

no doubt be greatly increased within a short time. Whatever our opinion of the political institutions of Russia may be, in Central Asia they prove themselves able and energetic civilizers, and their influence upon the vast extent of country east of the Caspian Sea has been highly beneficent.

MINING INDUSTRIES OF NEW ZEALAND.—The report on the mining industries of New Zealand for the year 1887, which has recently been issued, shows the great importance of these industries to the colony. There are nearly 12,000 persons engaged in gold-mining, the average annual earnings of miners being \$325, and the value of the gold exported being somewhat less than \$4,000,000. About 1,500 persons were engaged in coal-mining, their average earnings being \$540. While the value of gold-production has been decreasing continually ever since 1866, when it was more than \$14,000,000, the amount of coal has steadily increased, being at present over half a million tons, of which only a small portion is exported. The total value of mineral exports other than gold has made rapid progress during the past ten years, being more than \$2,000,000 in value, as compared to \$750,000 in 1878. Of special interest is the production of kauri-gum, on which the mining department reports, although it is a vegetable product. This product is the resinous exudation of the kauri-pine (*Dammara Australis*). It is found in deposits which extend more or less over the northern portion of the Auckland Provincial District, in forests, and more extensively in

advertised as "not a rum drink," contains 13.2 per cent of alcohol. Another, admitted to contain Marsala wine, contains as much alcohol as that wine. A coca beef tonic, advertised as made "with sherry," contains 23.2 per cent of alcohol, while sherry contains but 18 or 20 per cent. Parker's tonic, claimed to be a purely vegetable extract, "stimulus to the body without intoxicating," contains 41.6 per cent of alcohol. Whiskey and brandy contain but 50 per cent of alcohol. The advertisement of this tonic says, "Inebriates struggling to reform will find its tonic and sustaining influence on the nervous system a great help to their efforts." Schenck's seaweed tonic, said to be distilled from seaweed, and to be perfectly harmless, contains 19.5 per cent of alcohol; Baker's stomach bitters, 42.6 per cent; Hoofland's German bitters, advertised to be purely vegetable, and free from alcoholic stimulant, 26.5 per cent; and Hostetter's stomach bitters, 44.3 per cent. Kaufmann's sulphur bitters contains no sulphur, and is advertised to contain no alcohol, but was found by Dr. Davenport to contain 20.5 per cent. Richardson's concentrated sherry-wine bitters contains 47.5 per cent, 2.5 less than whiskey and brandy. Walker's vinegar bitters contains 6.1 per cent; and Copp's White Mountain bitters, about the same quantity.

CHEESE-POISONING.—From the *Sanitary Inspector* we learn that already this season there have been reported many cases of cheese-poisoning, particularly in Ohio. The State Board of Health



LOWER COURSE OF THE SARAFSHAN.

open country. The latter is evidently the site of ancient forests, of which, except the valuable gum, not a vestige remains. The extensive use of the gum as a varnish in America and Europe has for many years led to a large export trade. The value of the export in 1887 was £362,449 (about \$1,750,000), or equal to nearly one-half the value of the gold export of the colony for the same year. The search for the gum is engaged in by both Europeans and Maoris; and at certain seasons of the year as many as ten thousand persons are engaged in connection with this industry. The gum-digger's outfit consists of a steel-tipped prod, a spade, and a bag, and, although he cannot indulge in the dreams of sudden wealth which fascinate the gold-seeker, he is sure, at least, of always averaging fair wages. Since the commencement of this industry in 1853, the quantity exported to March 31, 1888, represents a value of more than \$22,000,000.

HEALTH MATTERS.

TONICS AND BITTERS.—In a former number of *Science* we called attention to the excellent work done by Dr. B. F. Davenport, chemist to the State Board of Health of Massachusetts, in the examination of foods and drugs. Recently he has been analyzing the tonics and bitters with which the market is flooded. The number of these which have been examined by him is forty-seven. Of this number, forty-six contain alcohol, in quantity varying from 6 to 47.5 per cent, 21.5 per cent being the average. One of the tonics,

of that State was, within a short time, notified of many cases, distributed as follows: at Urbana, sixty-five cases; Mansfield, fifty; West Liberty, thirty-five; Mutual, fourteen; Marion, fifty. The symptoms were vomiting, accompanied with much pain in the stomach, and, in many cases, violent purging. The sickness usually lasted from twelve to forty-eight hours, and great prostration was a marked feature, with syncope in some cases. No deaths occurred. Tyrotoxon is suspected.

THE TYPHOID-BACILLUS.—Dr. C. Seitz, after a careful study of the relation of Eberth's bacillus to typhoid-fever, comes to the following conclusions: 1. Typhoid-fever is produced by the immigration of the typhoid-bacillus. The specific bacillus is found exclusively and is present without exception in typhoid-fever. Inasmuch as typhoid-fever is an exclusively human disease, the negative experiments on animals should not be brought in opposition to the influence of the bacillus as the cause of the fever. 2. The bacillus finds in the intestinal canal of man the conditions for its multiplication, and from there, without penetrating deeply into the tissues, can endanger the organism with its virulent chemical products. 3. The bacillus leaves the intestinal canal (rarely the *vie urinarie*) of the typhoid patient in a condition capable of infecting. 4. On account of its essential biological qualities, it can retain its vitality a long while in the earth (here the saprophytic, or common putrefactive bacteria, impede its multiplication). 5. In water it can live at least a week; in ice, much longer. 6. In milk it can undergo a notable multiplication. 7. The principal means by which the